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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/577,978	05/25/2000	Yoshinori Ohsaki	684.3026	6455

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EXAMINER

NGUYEN, HUNG

ART UNIT	PAPER NUMBER
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2851

DATE MAILED: 01/03/2002

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/577,978

Applicant(s)

OHSAKI, YOSHINORI

Examiner

Henry Hung V Nguyen

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure should be carefully reviewed and ensure that any and all grammatically, idiomatic, and spelling or other minor errors are corrected. For instance: on page 2, line 26, reference to "bee" should read --been-- and on page 14, line 18, reference to "method method has bee" should be -- method has been--. Correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 1, the meaning, scope and breadth of the terms "*particular pattern*" is vague and indefinite. It is not clearly understood what "*particular pattern*" means. The recitation of "an information processing system operable, as a particular pattern...is imaged by said projection optical system" is ambiguous and not clearly understood.

As to claims 14, the recitation of "said second illumination system has *an additional use*, other than for detection of wavefront aberration information" or "second illumination is arranged to ...and for *additional use*" is ambiguous and indefinite.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6, 13-15, 18-19, 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Torigoe et al (U.S.Pat. 5,789,734) in view of Fukuda (JP-410284368A).

As best the claimed subject matters are understood (see rejection under 35 U.S.C. 112, second paragraph, supra. Claims are anticipated by references.

With regard to claims 1-6, 13-15, 18-19, 21-23, Torigoe et al (fig.1) discloses a exposure apparatus comprising: a projection optical system (31) for projecting a pattern formed on a mask (30) onto a substrate (32); a first exposure illumination system (1) for performing a first illumination condition; a second illumination system (82, 64-70) for performing illumination under second condition; a light quantity detecting system (76); a spherical aberration detecting system as well as spherical aberration measuring control/an information processing system (61, 73) illuminated by the second illumination system (see fig.1); wherein the first and second illumination having at least a common element (see fig.1 for instance: mirror 7); a reference flat device (81) placed on the wafer stage and an aberration adjusting device (101) for adjusting the aberration. Thus, Torigoe et al discloses substantially all basic features of the instant claims. Torigoe et al does not expressly disclose the wavefront aberration of the projection system being measured on the basis of detection of a light intensity distribution of the image of the pattern

Art Unit: 2851

through the light intensity detector. Fukuda teaches measuring wavefront aberration of a projection lens by measuring the light intensity distribution of projected images patterns through a light detector and using a method of phase recovery from the obtained light intensity distribution of the projected images (see abstract of Fukuda and fig.1-2). In view of such teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Torigoe et al and Fukuda to obtain the invention as specified in claims of the instant application. It would have been obvious to use the aberration measuring device of Torigoe to measure the aberration of the projection lens using the method of phase recovery from the obtained light intensity distribution of the projected images as taught by Fukuda for the purpose of computing the aberration of the projection optical system thereby the aberration of the projection optical system can be adjusted accurately and improving the quality of the patterns to be transferred.

With respect to claims 24-25, the method claims are seen to be inherent in existing of the above apparatuses.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Torigoe et al (U.S.Pat. 5,789,734) in view of Fukuda (JP-410284368A) and further in view of Terasawa et al (U.S.Pat. 5,331,369).

As to claim 20, Torigoe as modified by Fukuda lacks to show an enlarging optical system. Terasawa teaches an exposure apparatus having enlarging optical system (5) on the wafer stage (see fig.1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the enlarging optical system as taught by Terasawa into

Art Unit: 2851

the exposure apparatus of Torigoe et al as modified by Fukuda as a light intensity detecting system. It would have been obvious to utilize the enlarging optical system of Terasawa into the apparatus of Torigoe as modified by Fukuda for the purpose of measuring the intensity distribution on the stage.

Allowable Subject Matter

7. Claims 8-12 and 16, 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record either alone or in combination, neither discloses nor makes obvious an exposure apparatus having two illumination systems wherein the first illumination condition being incoherent while the second illumination condition being spatially coherent and/or satisfying conditions as recited in the instant claims.

Prior Art of Record

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Tanimoto et al (U.S.Pat. 4,701,606) discloses exposure apparatus for correcting the detected variations of the optical characteristic of the projection optical system.

Art Unit: 2851

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry Hung V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7723 for regular communications and 703-305-7723 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.


Henry/Hung V Nguyen
Examiner
Art Unit 2851

hvn
12/21/01